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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/763,198	01/26/2004	Chun-Fang Hsiao	MR3003-74	6427
4586	7590	05/18/2005	EXAMINER	
ROSENBERG, KLEIN & LEE 3458 ELLICOTT CENTER DRIVE-SUITE 101 ELLICOTT CITY, MD 21043			WYATT, KEVIN S	
			ART UNIT	PAPER NUMBER
			2878	

DATE MAILED: 05/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/763,198

Applicant(s)

HSIAO, ET AL.

Examiner

Kevin Wyatt

Art Unit

2878

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 January 2004.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-22 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 01/26/04 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

On page 6, line 4, "lest" should be changed to --least--.

On page 6, line 9, "may be not" should be changed to --may not be--.

On page 6, line 10, "are" should be changed to --area--.

On page 6, line 11, "unsteadily" should be changed to -- unsteady --.

On page 6, line 22, "trapezoid -like" should be changed to --trapezoid-like --.

On page 7, line 3, "may be permanently existed" should be changed to --may permanently exist--.

On page 7, line 10, "necessary" should be omitted.

On page 7, line 37, "light-emitting source 88" should be changed to --light-emitting source 18--.

Appropriate correction is required.

2. The abstract of the disclosure is objected to because of the following informalities:

Line 8, "is existed" should be changed to --exists--.

Appropriate correction is required.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: element (952) indicated on line 16 of page 8. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

4. Claims 6, 20 and 21 are objected to because of the following informalities:

In claim 6, line 2, "sections" should be changed to --section--

In claim 20, lines 3 and 4, "granting-holes" should be changed to --grating-holes--

In claim 21, line 3, "granting-hole" should be changed to --grating-hole--.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 2878

6. Claims 1, 3-9, 14 and 17-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Use of the terms "non-rectangular mode", "parallelogram mode", "trapezoid mode", "rectangular mode", in claims 1, 3-4, 18, 20 and 22 are indefinite and their intended meaning is unclear. In addition, the terms "parallelogram-like" and "trapezoid-like" are indefinite. Also, the description of the dimensions of said light-detecting elements in claims 5-9 is inadequate because the stated dimensions do not describe width of sections. As a result, the overall dimensions of said light-detecting elements are not clearly defined. Claims 2-4, 5, 7, 10 and 14 recite the following phrases: "said adjacent light-detecting", "said adjacent parallelogram-like", "said adjacent trapezoid-like", "said trapezoid-like", "said first horizontal section", "said second horizontal section", "said adjacent "T"-shaped", "said first logic signal", "said second logic signal." Therefore, there is insufficient antecedent basis for this limitation in those claims. In claim 17, it is not clear which components are involved in the term "inclined angle." In claim 20, the components involved "center of mask" and "slant grating holes" can only describe between them a 180 degree angle (which is not inclined), unless the plane surface and axis of rotation are mentioned. The phrase "at a vertical extension of each interval space" in claim 19, requires further clarification. Claims 17 and 20 recite the phrase "the main structure thereof comprising:" in line 1. Finally, claim 22 is unclear and confusing because the stated limitation "rectangular mode" is contradictory to the limitation "non-rectangular mode" of claim 1.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1,2,10 and 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Ernst (Patent No. 4,782,229) insofar as understood.

Regarding claim 1, Ernst shows in Fig. 1 the following elements of the applicant's claim: a) a light-emitting source (1) for generating a projecting light source; b) an optical mechanism (4) for receiving said projecting light source originated from said light-emitting source, and generating a signal light source after processing; c) a light-detecting device (7), fixed at one side of said optical mechanism, and having a plurality of light-detecting units (5) and (6) provided thereon, each of said light detecting units (5) and (6) including at least one light-detecting element (according to Figs. 3-6), provided as a non-rectangular mode, for receiving said signal light source.

Regarding claims 2 and 19, Ernst shows in Fig. 7 an array of light detecting elements providing interval space between each element and at a vertical extension of each interval space having a partially active area of one of the said light-detecting elements provided.

Art Unit: 2878

Regarding claim 10, Ernst shows in Fig. 3 light-detecting elements that provide said "T"-shaped modes within their overall shapes. These "T"-shaped light-detecting elements are also disposed in an inverted manner.

Regarding claim 17, Ernst shows in Fig. 1 the following elements of the applicant's claim: a) a light-emitting source (1) for generating a projecting light source; b) an optical mechanism (4) for receiving said projecting light source originated from said light-emitting source, and generating a signal light source after processing; c) a light-detecting device (7), fixed at one side of said optical mechanism, and having a plurality of light-detecting units (5) and (6) provided thereon, each of said light detecting units (5) and (6) including at least one light-detecting element (provided in Figs. 3-6), wherein between said light-detecting element and a light-irradiated zone projected by said signal light source, an inclined angle is provided.

Regarding claim 18, Ernst shows in Figs. 3-6 said light-detecting element is provided as said non-rectangular mode.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2878

11. Claims 3-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ernst (U.S. Patent No. 4,782,229).

Regarding claims 3-9, Ernst shows the claimed invention as above, but is silent that the light detecting element is provided as specific shapes. However, a change in shape is generally recognized as being within the level of ordinary skill in the art. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide a specific shape of the light detecting element, since such a modification would have involved a mere change in the shape of a component. *In re Dailey*, 149 USPQ 47 (CCPA 1966).

12. Claims 11,15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ernst (U.S. Patent No. 4,782,229) in view of Bidivile (U.S. Patent No. 6,552,716 B1).

Regarding claim 11, Ernst discloses the claimed invention as stated above. However, Ernst does not disclose a signal selection circuit 32. However, claim 6, lines 6-16 of Bidivile teaches an optical sensor chip performing the functions of said signal selection circuit 32. The optical sensor provides at least two photosensor circuits, each producing an electrical output signal having an amplitude corresponding to the amount of light absorbed from signal light source. Signal outputs from the photosensors are coupled to a plurality of comparators which provide two differential signal outputs characteristic of first and second logic signals which are fed into an R/S latch circuit. It would have been obvious to one of ordinary skill in the art to provide in Ernst a signal

Art Unit: 2878

selection circuit for the purpose of determining which light-detecting element has the largest light-receiving area.

Regarding claims 15 and 16 respectively, Ernst discloses the claimed invention as stated above. Ernst does not disclose an optical mechanism as a mask, having a plurality of grating holes chiseled at the periphery of mask. Ernst also fails to disclose said position detecting device as consisting of cursor indicator, having a mouse, and a knob. Bidivile (U.S. Patent No. 6,552,716 B1) discloses in Fig. 2, an encoder wheel having element 32 as an optical mask having a plurality of grating-holes chiseled at the periphery of said mask. In addition, claim 7 of Bidivile discloses a cursor control device for controlling cursor position on a video screen, and Bidivile discloses in claim 11 a user movable input comprising a ball (knob). In column 2 lines 44-46, 57 and 58, Bidivile describes in Fig. 1 a mouse 10 having a microprocessor which connects to a computer by means of a serial/PS2, USB or ADB port suggested. It would have been obvious to one of ordinary skill in the art to modify the device of Bidivile by using the variations of non-rectangular shaped elements in Ernst for the purpose of improving sensitivity and determinability in light-detecting elements in light-receiving areas.

13. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ernst (U.S. Patent No. 4,782,229) in view of Bidivile (U.S. Patent No. 6,552,716 B1) as applied to claim 11 above, and further in view of Bidivile (U.S. Patent No. 5,680,157).

Regarding claim 12, Ernst discloses the claimed invention as stated above. However, Ernst does not disclose said maximum current selection circuit 322. Bidivile

Art Unit: 2878

teaches a maximum current selection circuit in each of the current comparators 420A-D. According to Fig. 5A and column 6 lines 26-40 of Bidivile (U.S. Patent No. 5,680,157), the combination of current mirror circuits 510A and 510B, delayed current circuits 512A and 512B and elements 514A and 514B determine maximum current generated from either photodetector 400A or 400C in correspondence with the amount of absorbed light. It would have been obvious to one of ordinary skill in the art to provide in Ernst a maximum current selection circuit for the purpose of improving sensitivity and determinability of light-detecting units.

Regarding claims 13 and 14, Ernst discloses the claimed invention as stated above. Ernst does not disclose a comparative amplification circuit and a set/reset switch stated in claims 13 and 14 respectively. However, Bidivile (U.S. Patent No. 5,680,157) teaches in column 6 lines 7-12 a comparator circuit comprising a plurality of current comparators 420A-D. The comparators shown in Fig. 4 are designed to perform current comparisons from the photodetectors. According to column 6 lines 44-46, the resulting currents are then inverted and fed to the RS latches 430A-D (set/reset switches). Bidivile also teaches in column 3 lines 36-42 that each latch converts two comparator outputs (first and second logic signals) into a digital signal (shown in 3rd plot of Fig. 5D) which may be sampled by a microprocessor. It would have been obvious to one of ordinary skill in the art to provide in Ernst a comparative amplification circuit and a set/reset switch for the purpose of further improving sensitivity and determinability of light-detecting units.

Art Unit: 2878

14. Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ernst (U.S. Patent No. 4,782,229) in view of Bidivile (U.S. Patent No. 6,400,356 B1) insofar as understood.

Regarding claims 20 and 21 respectively, Ernst discloses the claimed invention as stated above. Ernst does not disclose a mask provided with a plurality of slant grating-holes for allowing signal light source to pass through. Ernst also fails to disclose a mask providing an inclined angle between center of mask and slant-grating holes along with a non-rectangular light irradiated zone formed by slant-grating holes on detecting device. Bidivile (U.S. Patent No. 6,400,356 B1) discloses in claim 2 a roller 18 (mask) having a plurality of slots 64 arranged according to column 3 line 55 in a non-radial pattern. Bidivile shows in Fig. 7 slots as having a position c) less than 90 degrees from the tangent of the roller's edge (slant grating-holes). Bidivile also discloses according to column 4 lines 16-20 an (inclined angle) between center of roller being the axis of rotation and the inner plane surface of roller (where the slots lie) due to approximate vertical movement and minimal lateral movement when the roller is depressed. The result produces a non-rectangular light irradiated zone on said light-detecting device. It would have been obvious to one of ordinary skill in the art to modify Bidivile by replacing the photodetector with one having two or more light-detecting units each having at least one light detecting element provided as a non-rectangular mode. This modification in Bidivile would allow non-rectangular light irradiated zones to be projected onto light-detecting elements, thus providing the benefit of improving sensitivity and accuracy of position detection.

Regarding claim 22 Ernst shows light-detecting elements provided as a rectangular mode in Fig.2 as well as light-detecting units provided as non-rectangular mode in Figs. 3-6.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Tatsuo Igushi (U.S. Patent No. 6,236,458 B1) discloses a particle distribution size measuring apparatus.

Yoshihiro Sakai (U.S. Patent No. 6,750,445 B1) discloses a slit structure of an encoder for preventing deterioration of precision during high speed operation.

Tom Vyse (U.S. Patent No. 4,965,446) discloses an optical interrupter system.

David A. Wright (U.S. Patent No. 5,886,352) discloses a readhead for an opto-electric encoder.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Wyatt whose telephone number is (571)-272-5974. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on (571)-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2878

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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